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Industrial Information on Hungary

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ANALYTICAL INSTRUMENTS

On a peaceful little street in a Budapest suburb is found the modest building of one of the establishments of the famous Hungarian precision mechanics industry, the Laboratory Equipment Plant. Here are produced complicated instruments of scientific research. In the past, most precision instruments were imported from abroad; today, however, the national production of these articles is so large that we can already export them in considerable quantities throughout Europe and even overseas.

We shall give here a brief sketch of what is produced in this plant. Here are manufactured the analytical scales with pneumatic brake which play a very important role in laboratory research. The use of the scales with pneumatic brake is more rapid and more convenient than that of the usual type of analytical scales for three main reasons:

1. After releasing, the scale makes one single balancing movement and stops;
2. On the micro-dial adjusted to the pointer of the scale, the difference in the load of the two little pans -- within a limit of 10 milligrams more or less -- can be directly observed with precision of 0.1 milligrams, without having to resort to the "hobby-horse".
3. The automatic device which places the fractions of weights, marks the sum of these fractions directly.

The advantages of these scales over others of different type are:

1. The source of the projection light is placed outside of the housing of the scale, so that the heat it produces does not affect the scale.
2. The projector mechanism is hermetically sealed and, therefore, protected from dust.
3. The projector mechanism is provided with a Porro prism which were changed originally by the projection itself.
4. The micro-dial has direct graduations of 0.1 milligram.

The design of the analytical scales with pneumatic brake is the most modern and precise. The moving parts of the scale are gilded. Not only the beams and counter-beams are made of agate, but all points of contact of the arrestor. The triple arresting system functions on the pans, support, stirrup and arc.

In order to eliminate the effect of vibrations on the scale there is a shock-absorber with rubber base.

The plant also produces different types of the very important photometers which serve to determine the composition of certain solid and liquid substances. Special emphasis is put on the manufacture of the ERSZA and DUBOSQU types. The photometric electro-light devices (photo electric cells) make the most exact colorimetric research possible for the determination of the composition of various materials on the basis of the differences in colors.

The ERSZA photometer with double photo electric cell is made

with a pair of selenium photo cells, four pairs of optical filters (red, orange, green and blue), an equalizing diaphragm and an orris diaphragm and a 50 micro-amperes reflecting dial reading scale with knife-edge pointer. The device can either be used with direct determination or with determination from zero. In order to illuminate the instrument, there is used a fixed-focus bulb of 6 volts 25 watts connected to a battery or to the electric current with a stabilized voltage transformer. When reading from zero the special bulb may be replaced with any lighting bulb.

The ERSZA photometer with simple photocell is made with a single photo cell, 4 simple optical filters, a fixed-focus bulb of 6 volts 25 watts for battery or current from stabilized voltage transformer has a 50 micro-amperes reflecting dial indicator, with knife edge pointer. The factory also produces a considerable quantity of thermometers. A short while ago we had to cover 80 percent of the national requirements through imports; today, however, we can supply all of the national requirements with ever larger quantities remaining for export. The accuracy of the thermometers produced by this plant corresponds to the international standards. Not only maximal thermometers are produced for determining human temperature, but thermometers for industrial use and laboratory use, which have won high repute throughout the world.

As magnificent proof of the skill and competence of the plant it is necessary to mention its excellent electrocardiographs, known as the EKG machines. These ultra modern electrocardiographs are based on a very important Hungarian invention. Previously functioning off batteries, the new models are now manufactured for standard source current. They are manufactured with perfect precision and, marking

exactly the slightest change in the functioning of the heart, they play a role of major importance in medical diagnosis and therapeutics, serving mankind in the best manner in this exciting epoch which is so filled with events. This machine serves for direct and immediate observation, registering only the altered functioning of the heart, without registering the normal functioning of the heart; hundreds of diagnoses per day can be made with a single machine. Today the entire output goes to national health centers, but in the near future they will be produced on an increasing scale for export. It should also be mentioned that the production of this plant is so varied that it can provide the analytical instruments necessary for all scientific research, the institute laboratories of the mineral oil, heavy chemical, cereal and flour, leather, wine and other industries.

Among the analytical instruments should also be mentioned the Demnstadt system ovens for elemental analysis which are of extraordinary scientific importance. This oven fulfills a very important role in ash analysis in laboratory analyses. The Berthelot-Mahler system calorimeter is another very important verifying apparatus for determining the caloric value of solid and liquid fuels. Different types of ball mills for the pulverization of materials in the work of analytical laboratories are also manufactured in large quantities.

The extraordinary development of the national glass industry has made it possible to manufacture a great number of very important analytical apparatus, the production of which was not even dreamed of a few years ago.

Among such apparatus are modern instruments for blood analysis built on the special Van Slyke system which serve to determine volumetrically, manometrically, and quantitatively the gases in the blood. The instruments of blood analysis of the Haldane system are also of great importance.

Among other modern laboratory apparatus the Strohlein furnaces (Marsch) for the determination carbon and sulphur content in iron and steel are also worthy of mention. They also manufacture the Schulek-Csuros-Ersza type universal agitators which have given very good service in practice. Used for horizontal agitation, they can handle flasks from 25 centileters to ten liters in volume. Of the Orsat-type apparatus for analysis of gases, the Orsat-Fischer apparatus serves to analyze smoke gases while the Orsat-Pfeifer apparatus renders incomparably useful service in research and analysis on natural gases, methane gas, and gases from combustion or of explosion motors.

/ The plant also makes thermostatic machines for purposes of bacteriological research and paraffin chambers for the cultivation of bacteria. Different types of sterilizers and autoclaves are produced for laboratories, with single or double wall, machines for the sterilization of bandages and gauze, and hot-air sterilizers (dry sterilizers) for glass objects and instruments. In addition dryers with automatic temperature regulators for laboratory controlled experiments are manufactured.

Various chemical and bacteriological apparatus, double-boilers, distillation apparatus, heat-proof glass funnels, laboratory shelves, burners and tongs, and various glass utensils for laboratories are

further clear illustration of the special competence and productive capacity of this plant. /

NEW PATHWAYS OF THE HUNGARIAN PHARMACEUTICAL INDUSTRY

The high level of the Hungarian pharmaceutical industry was already universally appreciated before World War II thanks to the excellence of its brand-name products. The Hungarian People's Democracy, born of the Liberation, has, nevertheless, opened the way to new possibilities of development unknown up to now. It was possible to repair the damage caused by the war to buildings, equipment, etc., in a relatively brief space of time. The economic plans have completely transformed the sphere of activity of the plants so that each one of them has specialized in the manufacture of the products best suited to its type of installation and to the professional skills of its staff. At the same time they have renewed the manufacture of the former preparations in quantities sufficient to meet the needs of the country and, in addition, to satisfy the demand from abroad.

At the present time pharmaceutical research work is oriented toward the development of public health and the struggle against illnesses among the population. The scientific institutes and the clinics are working in close collaboration with the plant laboratories. The former, in addition, have the task of aiding, counseling and exercising surveillance over the said plants from the point of view of the therapeutic and other requirements which their preparations must meet.

The Chinoin and Richter-Gedeon-Budapest plants, the largest of Southeastern Europe, have had a great reputation for many years.

The United Pharmaceutical and Dietetic Products Plants resulting from the merging of several factories, are on the road to creating great renown for themselves with their quality products. Phylaxia prepares serums, vaccines, etc, for human medicine and veterinary medicine; some of its preparations constitute new milestones on the road of scientific progress.

Public health considerations have oriented the activity of the plants toward the problem of tuberculosis. The result has been the preparation of various medicines such as Tebaminol-Chinoin (p-aminosalicylic acid) and Thiomid-Richter (dihydrocarbonate of aldehyde-para-acetyl-aminobenzoic acid). For surgery they have succeeded in producing Relaxil (- dihydroxide - 2 of methyl-phenol propane), a curare drug of more effective synthesis which is less dangerous than tubocurarine, as well as Thrombofort (trombine) a local hemostatic of great efficacy. T.E.A.B. (bromide of tetraethylammonium) is a powerful hypotensor, a dilator of the peripheral vascular system, which obtains this effect by the blocking of the sympathetic and parasympathetic systems. Urofort (2 analine, 4 amine-1, 3, 5 triacin) is an excellent diuretic free from mercury. Dolamid (4,4 diphenyl-6-dimethylaminoheptanol - 3 - om) is a synthetic substitute for morphine. Dienoestrol [3,4 bis - (p-oxyphenyl) 2-4 hexadion] is a synthetic preparation several times more effective than the natural follicular hormone. Minimum doses have complete effect, and in contrast to preparations of stilbestrol, the drug is free from secondary effects. It was possible to develop all these and many other preparations thanks to the increased scope of research work. One of the components of the P factor, rutin, the effective remedy for capillary fragility and permeability, is contained together with vitamin C and theophylline respectively in two pharmaceutical

specialties: Scorbutine and Theorutin. The amide of salicylic acid, this outstanding anti-rheumatic used today throughout the entire world was first put out for therapeutic purposes by a Hungarian pharmaceutical products plant under the name of Eggosalil. Among anti-hypertension drugs, Sympathomin, with effectiveness equal to adrenalin but completely inoffensive (chlorhydrate of paraoxyl-phenylethanolmethylamin), Tetracor, Corediol and Pulsoton (m-oxy-pro-phylobenzol) are the most important. Atriphos (adenosinetric-phosphoric acid) and Corhormone (hormone of the embryonic heart) are extremely effective heart stimulants. The most modern preparation for all forms of epilepsy are Antisacer (sodium salt of diphenylhydantoinate) and Scerno (methylphenylhydantoinate), while Ptimal (3,5,5, trimethyloxazolidin 2-4 dion) is the sovereign remedy for said disease in the phase called petit mal. Among the alkaloids must also be mentioned, in addition to morphine, codein, ethylmorphine, diacetylmorphine and its salts, Belloid for disturbances of the sympat etic and parasympatnetic nervous system, Hydrocodine (dihydrocodein) for difficult attacks of coughing which are almost impossible to stop with codeine. Dicaptol, with Bal effects is used as a remedy for poisoning caused by heavy metals. Depofollan, an excellent "chemical ovary" for the treatment of follicular hormone deposits has given satisfactory therapeutic results. Revival (sodaic salt of metadiamino-paradioxy-arsenobenzolo-methylene-sulfoxylic acid) and Dynarsen (amine of triethano-acetylaminooxyphenylarsenic) are remarkable antisyphilitics whose spirochetidal effectiveness far exceeds that of numerous well-known preparations and have less toxicity. Among other materials Cholumbral (sodaic salt of tetraiodophenolphthalein) is used in coleocystography, while Neorenumbral (sodaic salt of ortho-iodohypuric acid) is used

intravenously in dermagraphy.

The most recent vaccines are precipitated tetanic anatoxin and precipitated cholera vaccine with an efficacy approximately 8 to 10 times greater than that of current vaccines. In the veterinary field should be mentioned in particular the serum and vaccine against fowl plague. Thanks to the introduction of obligatory vaccination, this disease, which has caused great damage in the past, has completely disappeared in Hungary. The Hungarian pharmaceutical industry, availing itself of the resources offered to it by the economic plans of the People's Democracy, finds itself on the threshold of splendid new developments which will permit it to contribute in still greater measure to relieving the suffering of the sick of the whole country, thanks to the chemical purity and the therapeutic efficacy of its products.

NEWS OF THE FIVE-YEAR PLAN

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The first five-year plan was inaugurated 1 January

The chief objectives of the plan are the following: development of Hungarian industry, augmentation of the yield from agriculture, raising of the standard of living of the population, and transformation of agricultural Hungary into an industrial country with a well developed agriculture.

According to the report published on the results of the first year of the plan, accomplishments in 1950 surpassed original estimates by one third. In a single year manufacturing industry made greater progress than the old Hungary had accomplished in 20 years. Encouraged by this success, the Hungarian parliament at the beginning of 1951 passed a resolution revising the Five-Year Plan. The expansion of the estimates imposes increased tasks on the country.

In accordance with the augmented plan, in the course of 5 years 85 billion forints are to be invested in the national economy. The production of heavy industry is to quadruple, 341 new industrial plants will be established; in other words, every 5 days a new factory goes into construction in Hungary. The standard of living of the population will increase 50 percent and in 1954 will be twice as high as the prewar standard of living. The national income will increase 230 percent in 5 years.

MAJOR OBJECTIVES OF THE FIVE-YEAR PLAN

In May 1950 green wheat fields and tracts of beets still stretched where now are situated the yards of the Dunapentel Iron and Steel Works. The foundations of the buildings were laid around

the middle of last year. An entire city arose on the bank of the Danube. The construction plans comprising 45 volumes were worked out in 1949. Subsequently the experts worked out the details of the concrete tasks and the timetable for carrying out the construction work.

A woods extending over 2 kilometers in length and 1 kilometer in width has just been planted separating the factories from the city of dwellings.

The city is built in "dwelling units" each of which will be able to lodge 5,000 - 6,000 inhabitants. All the units will have their own social and cultural institutions such as school, day nursery, maternity school, parks, cultural center, and moving picture theater. Numerous stores are envisaged in order to facilitate the supplying of the inhabitants. Thus each household will have within reach everything necessary for its daily life. According to present estimates 35,000 workers will be able to be lodged in the city when the construction work is finished. The Dunapentele Iron and Steel Works will supply the machine-building industry with raw materials and the peasant workers with farm machinery.

SECOND QUARTER ACCOMPLISHMENTS OF THE SECOND YEAR OF THE FIVE-YEAR PLAN

In July the Central Statistical Bureau published a report on the development of industry, agriculture, communications, trade, and the material and cultural standard of living of the workers during the second quarter of 1951.

We shall cite a few figures from this report pertaining to the most important sectors of the people's economy.

Industry has continued its vigorous development. During the second quarter of 1951, the production of industry as a whole exceeded that of the corresponding period of the preceding year by 34.4 percent. Considered separately, heavy industrial production increased 39.7 percent, light industry 36.6 percent and food industry 11.2 percent. In other industries the increase in production compared with the same period for 1950 amounted to the following: mining industry 24.1 percent, metallurgy 37.2 percent, machine building industry 49.1 percent, construction materials industry 25 percent, and textile industry 25.4 percent. The mechanization of agriculture is being pursued at a lively rate. In a single year the number of tractors has increased 54.1 percent.

NEW HYDROELECTRIC PLANT ON THE TISZA

Formerly the devastating floods of the Tisza were considered an inevitable disaster. Today one of the finest projects of the Five-year Plan will rise on its banks: the Tiszalok Hydroelectric Power Plant. The construction materials used in this project exceed in quantity all the material used in the construction of hydroelectric plants built in Hungary in the past 50 years. The construction of the new plant requires 3 times as much iron as was required in the construction of the finest bridge in Budapest, the Lanchid (Bridge of Chains).

NEW SPINNING MILL UNDER CONSTRUCTION NEAR COTTON FIELDS

Cotton has recently been acclimatized in Hungary. At Kaposvar, in Transdanubia, a new modern spinning mill is under construction. The new mill will transform the raw cotton into yarn on the spot. The shops will be provided with air conditioning, dust aspirators, and humidity regulators for regulating the humidity of the air. One section of the plant will be put into operation during this year.

NEW MACHINES FOR MINES

Mechanization of the mining industry is being pursued at an intense pace. During the first 4 months of 1951 the mines received more than 600 machines including drilling machines, digging hammers, compressors, etc. The transportation of the coal extracted is accelerated by the use of automatic machines.

By the end of 1951, 55.5 percent of all coal mining will be carried out by power tools and 38 percent of mining transportation at the stopes will be motorized. In addition, the mechanization of loading operations has started. In the course of the Five-year Plan 19 new mines will be opened. In this year alone the construction of 3,328 dwellings for miners and 31 centers for young workers will be completed.

MECHANIZATION OF AGRICULTURE WILL BE INCREASED 15 PERCENT

The Council of Ministers has issued a decree concerning the 1951-1952 agricultural plan. According to this decree the area to be sown with cereal crops will increase 35 percent, and that sown with forage plants 16 percent compared with the present acreage. The growing of industrial crops will be intensified: cotton plantations will cover an area two and one-half times greater than that of today. Extensive areas of land will be used for the growing of kenaf and kok-sagiz. The production of improved seeds will also be furthered. The extent of irrigated areas will be increased by 50,000 cadastral acres. An increase of 15 percent in agricultural mechanization is likewise envisaged.

HUNGARY AT THE FAIRS

Machine tools and agricultural machines of the latest type formed the principal section of the Hungarian exposition at the September fair at Vienna. The NIKEX, Hungarian Company for Trade in Products of Heavy Industry showed there its most recent models of machines. Heavy industry was not the only branch, however, to call attention to itself at this demonstration by its special new designs. All the other enterprises engaged in Hungarian foreign trade achieved great triumphs both with their articles which are already known and appreciated on the world market as well as with new goods for exportation.

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Hungarian enterprises organized at joint exposition in the setting of the "Eriks Massan" at Stockholm. The visitors to the fair keenly appreciated the products of Hungarian industry. It was particularly the machine tools which experienced a remarkable triumph. The Swedish representative for Hungarian machinery, Mr. Folke Edqvist, stated that there did not exist a city of any importance in Sweden where Hungarian machinery was not being used. The Gora Plant placed an order² for 13 machine tools. The exposition has furnished proof of the productive might of Hungary. Apart from heavy industry, numerous articles such as motorcycles, electrical apparatus, telephones, incandescent bulbs, sewing machines, 8-mm film projectors, rubber goods, optical goods, textile products, shoes, as well as a rich variety of agricultural products were likewise exhibited.

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Five Hungarian enterprises took part in the Izmir Fair which was held from 20 August to 20 September. The TECHNOIMPEX enterprise exhibited the latest models of the Hungarian machine-building industry. ELEKTROIMPEX exhibited electrical goods and precision instruments; FERUNION exhibited technical articles, hardware, porcelain, glassware, etc. HUNGAROTEX distinguished itself by the elegance of its fabrics and of its ready-made goods, while the ARTEX exhibition included products of Hungarian handicraft, furniture, fine leather goods and sporting goods.

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The autumn fair at Leipzig took place this year from 2 September to 7 September. This time Hungary was represented by the Artex, Tannimpex and Medimpex enterprises. The specialties of the pharmaceutical industry, the leather industry and handicraft aroused particularly keen interest. The exhibition resulted in a favorable balance for Hungary through a brilliant success both from the morale and material point of view. Our representatives were scarcely ^{able} ~~able~~ to comply with the requests for information and with the orders coming in from every direction. /

TESTING A MOTORIZED TRAIN AT THE GANZ RAILROAD CAR PLANT

The Ganz Railroad Car and Machine-Building Plant has been engaged for nearly a quarter of a century in building motorized rail transport equipment. It has obtained, since the first years of its activity, technical results which have opened the world market to it and have placed it among the foremost enterprises of the world in this category.

We are going to describe briefly for you how the testing of a Ganz multi-car train takes place.

* * *

It is only six o'clock in the morning, but in the immense newly constructed assembly bay feverish activity is already going on. Surrounded by men in full activity one glimpses the six-car Diesel-electric motor train. The white-collar workers and the production workers of the plant have from the working drawing to the assembling, given the best of their work, and now that the vehicle is finished they all await the testing with emotion and curiosity.

Assembly workers with enormous fork wrenches are still tightening a few bolts on the truck of the traction car when, with a great din, a flatcar appears at the door of the shop. A hook attached to the end of a cable seizes the first car and pulls it out of the assembly bay.

Scarcely an hour goes by and the entire train is standing on the main track of the plant.

Then a new job begins -- the coupling of the cars. Assemblers jump between the cars and give a few more turns of the wrench to the bolts. Soon it is announced that the train is in running order. The engineers of the motor cars located at the front and rear of the long train press the starter buttons of the auxiliary Diesels. Suddenly the train begins to vibrate as the motors begin to fire. The production of the compressed air necessary before the operation of the train begins.

"Brake test" signals the engineer of the first control cabin. The compressed air whistles through the valves of the brakes and the brake-shoes are applied with a crash to the rims of the wheels.

Then the powerful 16 cylinder Diesel combustion motors, producing the traction current for the principal drive unit, can start. The main gate of the plant is opened and the track watchmen, flag in hand, take their positions. The engineer in charge of the test gives the signal to leave. The "long-short-long" call of the horn resounds in the air. The motors begin to rumble. The train begins to roll slowly toward the marshaling yard.

After a wait of a few moments, the signal for leaving the station indicates that the track is clear. The green disk of the

signalman comes up and the engineer throws the operating lever into gear. The train gets under way.

The start is gentle and uniform. However the speed increases rapidly. The harnessed strength of 1,200 horses causes the speedometer needle to mount in a few moments to 40-50 kilometers per hour. Six to seven persons are pressed together in the engineer's cabin. Suddenly one of the engineers gives some instructions to the electrician near him. The latter immediately disappears into the engine compartment. A few seconds later the vibration of the ammeter needle and a gesture of satisfaction by the engineer indicate that the electrician has done his work well.

Another engineer holds two chronometers and a writing pad in his hand. He notes rapidly the values indicated by the instruments. Each time that a kilometer marker passes by the window the click of the chronometer is heard and the time indicated is noted on the paper.

The strident sound of a bell is heard. Someone takes the receiver. From the rear motor car they ask what the operating air pressure is. After a run of a half hour, it is to be supposed that the train ~~is ready~~ ^{is ready} to go. The order resounds: "Open it up!" The engineer of the train pulls the load-regulating lever all the way. The throbbing of the motors becomes still more accentuated. The strokes of the pistons are multiplied and soon the blue body of the train splits the air at more than 120 kilometers per hour.

In the engine compartment, in the midst of the almost unbearable din, technicians observe, regulate, and measure.

Then comes the test of running on inertia. Suddenly the sound

of the motors become faint and the force of traction ceases. This mass of iron weighing nearly 350 tons and traversing 30 meters a second has been able to accumulate so much energy that 12 minutes after disconnecting the motors it is still rolling at a speed of 60 kilometers per hour. The tick-tock of the chronometers continues to make itself heard: the engineers, whom nothing escapes, pick up important data from the slowing down of the train.

And it continues thus for kilometers and for hours. The time flies by. Each one has so much to do and to observe that one scarcely notices how quickly the time is passing. It is nightfall when the train returns to the plant. The bands of light from the headlights flood with a white brightness the gate of the factory which opens before the train. The test is over -- here we are back again.

Spirits are full of pride; the test came off well, the train is good, and it will be able to achieve brilliant new triumphs abroad.

PRODUCTS OF THE BUDAPEST LIGHT MOTORS AND MACHINERY PLANT

The NV-750/2 gasoline motors and the MIA and MIB motors (Hofherr models) built by this plant are very much sought after abroad. The NV-750/2 motor is designed especially for portable machines (generators, pumps, etc). Such use requires an extremely light motor of great power. In order to attain this end the housing, control box, etc, are cast from light metal alloy. The working parts are made of materials having a high durability resistance: the cylinders and cylinder heads, which are water-cooled, are made of a special alloy casting, while the crankshaft, cam shaft with its gearing

and the fly-wheel are made of nickel chrome steel. The 8 horsepower motor weighs 65 to 80 kilograms, although it only does 1,500 revolutions per minute.

A piston pump with reciprocating cylinder governed by a cam, transmits oil through the slits in the crankcase to the crank-pins and the connecting rod bearings. The splash oil flowing from the connecting rod bearings lubricates the cylinders. All other bearings are ball bearings, including the main crankshaft bearings and the cam shaft bearings. A fly-ball centrifugal governor of great sensitivity acts on the throttle and checks the speed of the motor. This permits the motor to operate the generators at a constant speed. A special radiator allows this water-cooled motor to be adapted to several different portable machines. The radiator is arranged around the fly-wheel and thus does not increase the space taken up. The two horizontal cylinders of the motor are opposed to each other giving the motor perfect balance which could never be obtained with two cylinders in [a symmetrical] juxtaposition. Thus the motor runs without noticeable vibration like a four-cylinder motor. The extremely reduced speed of this portable motor permits universal use of it.

The MIA and MIB heavy oil motors, Hofherr models, start on gasoline. They are strong, heavy engines for stationery use where the weight of the engine is of no consequence. They are provided with a cast metal housing, single horizontal cylinder, two large flywheels, a driving wheel and an evaporation cooling system with open funnel cast in one piece with the crankcase. The construction and operation of these motors are very simple, which is an essential characteristic for use in agriculture and in the building industry.

The use of heavy oil has the advantage that this fuel is much less inflammable than gasoline, which is particularly important in agriculture. The consumption under full load is about 300 grams per horse-power hour. It is, however, also possible to use gasoline as fuel. The two engines described have high voltage and spark-plug magneto ignition. The magneto, mounted behind one of the flywheels is readily accessible and is stationery. The stationery magneto is much more dependable in service than the flywheel magneto. The MIA and MIB engines are also provided with fly-ball centrifugal governors. The speed is readily controlled from the exterior. The governor is located inside the cast metal control box.

The machine is provided with an economical splash-type lubricating system. The crankshaft is mounted on ball bearings, while the connecting rod bearings are provided with bearings of ample size.. The MIA engine is 4-6 horsepower at 800-1,150 revolutions per minute, while the MIB engine is 7-10 horsepower at 750-1,100 revolutions per minute.

THE DEVELOPMENT OF FLOUR-MILLING MACHINE-BUILDING

The flour-milling industry did not experience a considerable upsurge until the time when the Ganz and Company Factory perfected its chilled cast-iron cylinders. Designed and manufactured in this plant, these cylinders were soon used throughout the entire world.

For a long time cylindrical millstones of chilled cast iron of satisfactory quality were only made in Hungary. The progress of the machine-building industry also permitted the flour-milling industry to perfect itself. Our cylindrical millstones of chilled cast iron of the EMAG (First Hungarian Agricultural-Machine Building

Plant) brand and those of the EMAG-GANZ brand are export articles of great repute. They have found an outlet abroad in considerable quantities. It fell to the Hungarian flour mills to transform the excellent wheat into no less excellent flour. In order to satisfy this requirement the Hungarian plants producing equipment used by the flour mills have had to show themselves equal to their task and to supply very modern equipment, permitting the obtaining of superfine flour. The progress realized in the construction of chilled cast iron cylinders was necessary to bring about the perfecting of all flour-milling equipment. Other inventions such as the flat drumsieve (Plansifter) and the semolina and coarse flour cleaner, which are credited to Charles Haggermacher, were introduced in 1887 and completed the equipment of our mills.

This modern equipment also contributed to a large extent to improving the quality of milling in Hungary.

In addition to these machines, which constitute the essential equipment of the flour mills, we produce others also, particularly cleaners and classifiers of grain, wheat washers, sifters, etc; in brief, all the equipment needed to get wheat ready for milling. Our flour milling equipment plants are likewise capable of producing excellent equipment for storehouses and silos.

NEW DEVELOPMENTS IN HUNGARIAN LOCOMOTIVE BUILDING

Locomotive building is one of the oldest heavy industries in Hungary. In 1951 it celebrated the 80th anniversary of its establishment. The rapid progress of its development resulted, after World War II, thanks to the new planned economy, in an expansion

unknown up to then. The 2-C-2 superheated steam locomotive with twin engines and tender with five axles was built in 1950. Its frame is characterized by the relatively reduced wheel-base (4,500 millimeter) of the driving axles and the advantageously great length of the guides (10,600 millimeter) which gives the locomotive excellent operating qualities. The weight on the driving axles can be changed from 16.5 tons (normal value) to 18 tons, the value contemplated after the successive strengthening of the Hungarian tracks.

The great power of this locomotive required the inclusion of a large boiler the stoking of which exceeds the normal capacity of a fireman. An automatic stoking device (standard stoker), located in the tender, mechanizes this work.

The locomotive is provided with a Knorr automatic brake with supplementary brake and with a centrifugal regulator for braking pressure, which permits this pressure to be automatically adapted to the changing speed.

The cab of the locomotive is entirely enclosed. For your information we give below the main specifications:

Wheel track	1,435 millimeters
Diameter of piston	550 "
Piston stroke	700 "
Diameter of driving wheel	2,000 "
Steam pressure	18 atm
Heating surface of the boiler	240 square meters
Heating surface of the superheater	95 "

Weight of the locomotive in service	95 kg. (sic)
Force of traction calculated from friction	7,920/8,640 kg
Maximum speed	120 kilometers per hour

Superheated steam twin-engine locomotive "E" for freight trains was built in 1946. The great Belpaire-system boiler is provided with welded support rails and with a Schmidt-system superheater. The boiler itself is also completely welded with the sole exception of the hoops of the body, which are riveted. The Heusinger engine control acts on a Trofimoff-system round slide-valve. The power and operating qualities of the engine are remarkable. Its cab is a large compartment, very light, and provided with a system of heating formed by wall of the tender. The locomotive is provided with electric lighting.

Specifications are as follows:

Wheel track	1,524 mm
Wheel diameter	1,320 mm
Steam pressure	14 atm
Wheel-base of fixed wheels	4,320 mm
Heating surface of the boiler and of the superheater	254 square meters
Weight of the locomotive in service	85 tons
Calculated force of traction (0.6 p)	18,850 kg.

Superheated steam locomotive "D" for narrow-gauge track with twin engines was built in 1950. The frame and the boiler are of welded construction. The steam passes through a valve regulator, then through

a slide valve with Heusinger control.

The brake is steam-controlled and acts on all four axles. The tender contains a welded water tank and a compartment for the stoking wood. The cab is entirely enclosed thanks to an inter-communication "concertina" vestibule between the locomotive and the tender.

Main specifications:

Track	750 millimeters
Cylinder diameter	285 "
Piston stroke	300 "
Wheel diameter	600 "
Steam pressure	13 atm
Weight locomotive empty	14 tons
Service weight of the locomotive	16 tons
Speed permitted	35 kilometers per hour
Calculated force of traction	3,168 kilograms

The model Bo-Co electric locomotive for the Kando system of traction was built in 1950. The limited scope of this article does not permit further amplification with respect to the Kando system. Let it suffice to mention that this system permits the locomotive to take its power directly from the general distribution generating stations of 50 cycle alternating current. This current (entering the locomotive at 16,000 volts) is transformed into multi-phase current of average voltage and variable frequency according to the speed of traction desired. The transformations are made by means of a

phase converter and a frequency converter in the locomotive. The current thus transformed feeds five motors acting directly on the axles through gears. The motors have a "Tramway" suspension in the Ganz-Ronay system pivoting bumpers.

Main specifications:

Track	1,435 millimeters
Diameter of the driving wheels	1,040 "
Service weight	85 tons
Maximum axle pressure	17 tons
Number of operating motors	5
Power per hour at speed I and IV	3,200 HP
Speeds: Step I:	25 kilometers per hour
Step II:	50 kilometers per hour
Step III:	75 kilometers per hour
Step IV:	100 kilometers per hour
Step V:	125 kilometers per hour
Maximum power of traction at time of starting:	21,000 kg in speed I.

This short review of our new models of locomotives will permit the reader to appreciate the enormous progress made in the manufacture of locomotives in Hungary during the last few years. In fact, this industry today is capable of meeting the most advanced requirements of rail traction and is still adding to the repute of the Hungarian worker and technician.

phase converter and a frequency converter in the locomotive. The current thus transformed feeds five motors acting directly on the axles through gears. The motors have a "Tramway" suspension in the Ganz-Ronay system pivoting bumpers.

Main specifications:

Track	1,435 millimeters
Diameter of the driving wheels	1,040 "
Service weight	85 tons
Maximum axle pressure	17 tons
Number of operating motors	5
Power per hour at speed I and IV	3,200 HP
Speeds: Step I:	25 kilometers per hour
Step II:	50 kilometers per hour
Step III:	75 kilometers per hour
Step IV:	100 kilometers per hour
Step V:	125 kilometers per hour
Maximum power of traction at time of starting:	21,000 kg in speed I.

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PASSENGER CARS BUILT BY THE HUNGARIAN RAILROAD CAR AND
MACHINE-BUILDING PLANT

The Hungarian Railroad Car and Machine Building Plant ranks among the foremost enterprises of heavy industry and its products are well known abroad also. As far back as 1898 the plant celebrated the completion of its 1000th car. Since then the plant has not ceased to enlarge its export activity. The European countries and later overseas countries successfully joined the ranks of purchasers of the cars built by the Railroad Car Plant.

After the World War II the output capacity and consequently the export activity of the plant increased more and more.

We give below a glimpse of some characteristic types of cars manufactured at the present time.

Passenger Car, Salon Type, Second Class with Radial Truck

The factory has delivered to the Egyptian State Railways second class salon type cars with radial truck, having a maximum speed of 140 kilometers per hour with 64 seats, painted aluminum color. The frame and the body were manufactured of arc-welded sectional steel. All of the walls as well as the roof of the car are insulated with Limpet asbestos. The facing of the inner wall is of Formica material of a greenish color. The seats are provided with cushions of Dunlopillo rubber, covered with leatheret. The floor is covered with a rubber carpet 6 millimeters in thickness. In the car there is a refreshment compartment provided with an electric frigidaire, a water-cooler and an electric hot plate. The windows are provided with Venetian blinds. Illumination is

supplied by a 24-volt dynamo combined with a storage battery unit which also furnishes the necessary current for the electric fans. The brakes are vacuum system brakes. The coupling and bumper apparatus is provided with rubberized springs.

20 Cubic Meter Car for the Transportation of Earth^t

These are cars with radial trucks of the Diamond type for the transportation of gravel ores, etc. The body of the car is made of sectional steel, with a facing of steel plates. Unloading is done by hand tilting or by mechanical tilting functioning on an air pressure of 5 atmospheres. The brake system includes a Knorr pneumatic brake and a hand brake.

Third Class Passenger Car

The third class car, composed of ten compartments with 80 seats, is of welded construction with radial truck and SKF roller bearings. The frame and the body of the car are self-supporting and made of arc-welded sectional steel. The inner facing of the walls is made of plywood covered with varnished oak veneer. The outer windows and the windows of the compartments are provided with imitation-leather shades. Illumination is supplied by a dynamo run by a universal joint and combined with a 34-volt Ganz-system storage battery. The Kurz system steam heating is low pressure with main piping set up for 5 atmospheres. The brake installation is of the HIKP 1 type, Hildebrand-Knorr system. A hand brake is likewise provided in the car. The car is also provided with electric heating of 1,000 volts, 50 per monophase.

Mail Car with Radial Truck

This is a car with normal wheel-base, four axles, for the transportation of mail, parcel post packages and perishable goods; has a brake compartment. The framework and the body, made of welded sectional iron and iron plates, form a self-supporting structure. The radial truck is of riveted construction of the Sheffield-Twinborrow type, with Timken roller bearings and is provided with a coupling with ESF type rubberized springs. The electric illumination of the car is furnished by a dynamo and a 24-volt storage battery. Insulation is of Limpet asbestos, the induroleum floor is molded on pressed plates. The inner facing of the car is made of plywood.

IKARUS 30 AUTOBUS

Light Autobus Built in One Piece

The Ikarus 30 autobuses come in two models: city autobus with 22 seats and standing room for 18 persons, and the inter-urban autobus with 31 seats and roof fitted up to carry 500 kilograms of baggage. The Ikarus 30 light autobus is built in one piece without a chassis with solid front. The powerful 4-cylinder Diesel motor, four-cycle with precombustion chamber and "wet" cylinder heads (Steyr license) is very economical in output and speed, it saves fuel and time. The gear box forms a single unit with the motor. It has five forward speeds and one reverse speed. Transmission takes place through universal joint shaft with elastic suspension having very thin roller bearings. The bus has four wheel oil-hydraulic brakes with pneumatic control, as well as a hand brake

with cable acting on the rear wheels. It has extra 8.26 x 20 tires and double tires on the rear wheels.

Ventilation takes place through a grill-work opening above the windshield in the front of the vehicle thus permitting the circulation of fresh air in the car. Upon request a hot-air heating system can be installed in the car.

The electrical equipment of the car comprises two headlights with highway lights and dimmers for city use, and two fog-lights. The exterior of the bus is finished in nitro-cellulose enamel of two colors to be chosen by the purchaser.

The dimensions and output of the car are as follows: distance between the axles, 4,600 millimeters, total length exclusive of bumpers, 8,245 millimeters; running weight, 4,600 kilograms; maximum speed, 75 kilometers per hour; maximum uphill grade, 26-30 percent. The consumption of fuel varies according to service between 16 and 20 liters per 100 kilometers. Capacity of the tank is 120 liters.

HIGH-PRODUCTION MILLING MACHINES SERIES NO 22

The economical manufacture of precise and perfect machine parts is only possible through the use of machine tools whose characteristics in the field of the machining metals, meet the requirements of the present time. As far as milling is concerned, the new high-production milling machines, series No 22, entirely fulfill this condition. The high-production milling machines of series No 22 are manufactured in the horizontal EF type, the universal UF type

and the vertical VF type. The chief advantages of these machines are the following: control by a single lever ("monolever"), simple operations, high-production lasting precision, universal utilization, great reliability of operation, and protection against accidents.

Main Features

The column, pyramidal in shape, is of extremely rugged construction, and consequently ensures quiet machining, free from vibration regardless of the load. The prismatic-profile sliding arm supports in the most adequate way the milling arbor. The adjustable slides on the frame of the bracket and of the table, which are wide and long, as well as the precision control of the bracket ensure the greatest precision. A large range of speed steps of the arbor and feed movements makes it possible to meet the most varied requirements of milling. Features include independent control of the arbor and feed movements, rapid table travel, control by a single lever, automatic change of arbor speed, preselection of cutting speeds, speed calculator, precise disconnecting of feed, rapid feed movements with adjustable checks, cycle with rapid feed for empty runs, screw for raising the table, protection from chips and cooling liquid by means of automatic lubrication; safety control which with mechanical feed, automatically disconnects the control wheels; easy assembly, quality materials, perfect heat treatment, precision machining.

The Arbor and its Control

The motor mounted in the lower part of the frame controls the speed-change mechanism through five trapezoidal belts, well dimensioned. The speed-change mechanism is a completely new design and forms an entirely independent unit.

The change of speeds takes place through an electrohydraulic servo-mechanism controlled by a single lever. The speed calculator is connected to the speed indicator dial. This is a very important auxiliary device, by the aid of which one can easily and quickly select the cutting speed which is most suitable for the material of the part to be machined, for the diameter and material of the milling cutter, as well as for the finish which one wishes to give to the surface to be machined.

In front the arbor turns in a conical-bore bearing with a double row of roller bearings, allowing precise adjustment of the radial play of the bearing.

The vertical model corresponds exactly to the horizontal models. The head receives the transmission of the principal control lever through a pair of conical gears with a ratio reduction of 1.1. The vertical movement of the arbor takes place by means of a forward cross-arm, through a pair of conical gears and an endless screw. The amount of the movement may be read on a graduated dial. The checks placed at the front part of the head serve to limit with precision the vertical movement. The lower check is fixed and may be regulated by a micrometric screw. In the case of precision work, with the use of the check, the upper check, mounted on the movable sleeve will be provided with a dial comparator. The head of the arbor carrier is provided with an independent lubricating system. Visible level glasses permit the oil level to be checked at all times.

The table

The table is provided with three T grooves. A wide channel to receive the moistening liquid encircles the table. The latter rests on the long slipper guide of the transverse carriage which, in turn, moves on the wide guiding surface of the bracket. The bracket is of sturdy construction and well ribbed inside. The construction of the wide slipper guides provides for close guiding on rectangular slipper guides.

Control. Control by Single Lever

The machine is controlled by a single lever (monolever) placed in the center of the front part of the bracket. This lever particularly controls the connecting and disconnecting of the arbor, the engaging of the feed movement, as well as the rapid travel, and, in case of transverse movement, the preselection of the speed of the arbor and its engagement. Such a solution of the maneuver permits the worker to do his work without changing position, in the most simple manner, with the greatest degree of safety, to the complete exclusion of false moves and in the shortest time with a minimum of effort.

The control lever moves in two planes and in three directions. The direction of its movement coincides with the direction of the feed movement of the table and hence, the control of the machine proves to be particularly simple and clear.

The caps of the button mounted on the end of the control lever is made of red plastic material which is transparent and unbreakable. Inside the button is an electric bulb. On the one hand, the red light

when lit indicates, after plugging in the main circuit-breaker that the electricity is running through the machine and that it is ready to operate; on the other hand, it goes out when the lever is pressed, indicating that the preselector is operating. At the end of the table travel, the adjusted contact makers at the end of the run disconnect the feed movement at the point desired. The crank handle placed on the axis of the control lever also permits hand feed in three directions. In addition longitudinal feed can be executed through a control wheel.

Control of the Feed Movement

The control of the feed movement forms a completely independent unit set into the front of the bracket. It connects with the motor installed alongside by means of a safety clutch with spur gears. The elevating screw is made of a single ^{piece} ~~piece~~ of high strength steel, case-hardened, tempered, with rectified thread.

The changing of the feed movement takes place by means of sliding wheels, gliding over channeled shafts. All the shafts are supported on bearings. The material, the heat treatment, as well as the machining of the parts are identical to those in the arbor control.

The choice of feed rate takes place through a single crank handle placed in the middle of the dial indicating the feed rate. With one turn of the crank handle, made in either direction, the dial moves one degree. The crank handle is maintained in position by a spring control lever.

Main Specifications

EF - UF VF

Total dimensions of the table (mm)	1500 x 385
Utilizable surface (mm)	800 x 295
Longitudinal mechanical feed (mm/min)	800
Transverse mechanical feed (mm/min)	295
Vertical mechanical feed (mm/min)	420
Number of arbor speeds	20
Coefficient of speed steps	1.26
Scale of arbor speeds: (revolutions/min)	19-1,500
Number of feeds	18
Longitudinal and transverse feeds (mm/min)	10-500
Vertical feed (mm/min)	5-250
Rapid longitudinal and transverse travel (mm/min)	2,000
Rapid vertical travel (mm/min)	1,000
Power of the motor of the arbor (HP)	12.5
Power of the motor of the feed (HP)	2.5
Net weight (kg)	3,900

HOFHERR MODEL G-35 AND R-50/55 TRACTORS

Most farming operations must take place within a definite period of time. For this reason, it is of basic importance that farm machines be tested and that they offer complete reliability of operation, for the delay resulting from breakdowns can cause great damage, even the destruction of the harvest. Reliability of operation is of special importance as far as tractors are concerned, since it is

the latter which supply the other farm machines with the power necessary for their operation. The operation of the tractor must at the same time be economical, that is the cost of the power furnished must be as low as possible.

It is precisely from the point of view of reliability and profitability that the Hofherr tractors have proven themselves capable of meeting competition with any other tractors, particularly where it is necessary to work under difficult conditions.

The simplicity of design has the advantage right from the start that with fewer component parts there is less probability of breakdown. Then the repair of a less complicated mechanism requires less expert knowledge and, finally, fewer replacement parts. The design of the Hofherr tractors, which have a one-cylinder motor with incandescent cylinder head, is simpler than that of tractors built carburetor motor or Diesel motor.

From the point of view of reliability of operation, the fuel requirements of the tractor likewise play an important part. The less sensitive the tractor is to the quality of the fuel, the easier it will be to ensure its operation. The motor of the Hofherr tractor has remarkable qualities in this respect also, for it can function not only with gazolene (a trade name) but on kerosene, gasoline, or mixtures of the latter. It is a quality which no other type of motor possess. Its system of greasing permits economical lubrication.

The advantage of a simple mechanism shows up particularly when the persons who operate it have but little expert knowledge.

From the above description it is evident that the more unfavorable

the circumstances under which the tractor must operate, the more the advantages of the Hofherr tractor stand out.

The profitability of operation of the tractor likewise depends on many factors. It goes without saying that the favorable fuel consumption of the motor is of great importance. The Hofherr tractors consume 270 to 280 grams of gasoline or kerosene per horsepower hour, while in the case of high octane fuels the specific consumption goes below 250 grams. For this type of motor the fuel is supplied by means of an individual fuel pump, which means that the formation of a favorable mixture is independent of the number of revolutions of the motor. Consequently the specific consumption of the motor increases much less under small loads than is the case with motors having a carburetor. On the other hand, with a reduced number of revolutions the moment of the motor increases appreciably, that is to say the motor is more "elastic". All this contributes greatly to the profitability of operation. Naturally the economical lubrication, as well as the possibility of using lower grades of lubricants, enter into consideration in this connection.

In addition to the foregoing, the renewal of replacement parts is also of great importance in the make-up of operating costs. Experience shows that the cost of replacing spare parts of the Hofherr tractors is considerably lower than for tractors of any other make, which contributes greatly toward making the Hofherr tractors able to meet all competition. From the point of view of cost price, the amount of the power produced by the motor which is lost before being utilized could not be a matter of indifference. If the Hofherr tractor operates in a stationery position, that is to say, if it drives a machine

by belt transmission, the entire power of the motor can be utilized, with the exception of the unavoidable losses resulting from this type of transmission. That is due to the arrangement of the pulley which is mounted directly on the main shaft of the motor while in the case of most other tractors the pulley is controlled through a geared transmission, which, necessarily, involves (friction) losses.

On the other hand, in the case of mobile operation, the Hofherr tractors offer the advantage that, with the exception of the differential, their transmission mechanism is composed of spur gears efficiency at which is much higher than that of bevelled pairs. The weight of the Hofherr tractors is well proportioned to the performance of the motor. Consequently, as is the case in their well-designed transmission mechanism the tractive capacities are very favorable.

The high-power model R-50/55 tractor may be used successfully, particularly for firm soils, while for semi-firm soils and especially for light soils it is advisable to use the lighter model G-30/35 tractor, with a lower power motor. For light soils it is advantageous to use this tractor with low pressure pneumatic tires of large dimensions. In case of pneumatic tires, both types are suitable for hauling, especially if they are provided with a speed accelerator.

HOW IS THE CSEPEL BICYCLE MANUFACTURED

The gigantic machine which operates at a pressure of 100 tons snaps shut with a great crash. It is this machine which forms the large-capacity sprocket wheels of the Csepel bicycles. It turns out

200 per hour. The steel main axle of the bicycle is hardened in a few moments by a high-frequency electric machine.

The head of the technical section is delighted to tell us about the quality of the material in this important piece.

The frames of boys' and girls' bicycles are made of seamless Mannesmann steel, hot drawn and cold machined to the right size. In accordance with modern technology we may say that it is this steel which is best suited to satisfying the requirements of bicycle frames.

In a special shop the frames of the bicycles are given an anti-rust treatment. In this intense heat the copper of the fork, even chemically, forms a single piece with the steel tube.

The heart, the center of the bicycle are the hubs [sic] and the handle-bar. It was only after long technical and laboratory experiments that they succeeded in bringing out the modern product of today^{at} Csepel. We can see in operation in the immense machine shop the most modern automatic machine tools.

The bicycles and their component parts are subjected to a minute check as to quality, both during the process of manufacture and after finishing. The factory attaches great importance to the quality of the welding. We stop in front of a modern electric welding device of medium frequency. The advantage of it is that it only heats the part of the piece which is to be worked.

In the paint shop we are greeted by the gay note of multi-colored tints. The pretty, brilliant tints, black, red, blue, etc. of the frames and of the forks of the bicycles are obtained by a double enameling.

The shining spokes are placed in the wheels by specialized workers with extreme rapidity. The automatic conveyor belt advances by one movement every 45 seconds. A turn of a screw, then a brief automatic movement and the lacquered mudguard, the big sprocket wheel, coated with chromium and shining like a mirror, as well as the pedals, are all in place. This is how the wheels are tightened in the steel arms of the forks and how the handle-bars of different curves are fixed in place. The handling cars transport the bicycles and the finished parts, in a continuous going and coming, to their last station in the plant: the store-room. Here the bicycles and the parts are packed with care in an expert manner, which will enable them to arrive in perfect condition at their destination, even the most distant. The bicycles again see the light of day at The Hague, Rotterdam, Sidney, Buenos Aires, and on the sunny isle of Ceylon in order to facilitate and accelerate the traffic of all the workers of the entire world.

THE CSEPEL SEWING MACHINE, A LUXURY PIECE OF FURNITURE AND WORKING TOOL

They must have taken me by mistake into the cabinet-making shop of the Matyas Rakosi Plant, the visitor says to himself, when he enters the sewing machine factory. But this impression is only due to the innumerable varnished cases, of closet type, with brilliant glints.

"These are the cases of the sewing machines", they reply to me, smiling. "You wish to see the type 30 Csepel sewing machines, don't you?" A woman worker informs us, with an astonishing amount

of knowledge, of the technical characteristics of this excellent little machine. She tells us that the Csepel 30 sewing machine sews forward and backward. Forward sewing is done over the "O" position of the stitch regulator. She shows us that the winder is mounted on the machine and disconnects automatically as soon as the winding is completed. The machine also serves for embroidering and quilting. For this work it is necessary to lower the feed mechanism by turning the button on the plate of the machine. It makes 1,200 stitches per minute having a maximum length of 4mm.

The "Salon-Cabinet", the Star of the Csepel 30s

The Csepel 30 is a most modern type and is manufactured in several varieties. Among the pedal sewing machines which are used in most countries, we notice others which are activated by hand. The Arab women prefer this type of sewing machine. It rests on metal feet, it is light, durable, varnished and can be lowered into the table by a simple movement of the hand. Its smooth and shining surface can then serve as a table for light refreshments or for playing games. Industrious hands gather together the accessories which will be placed in the drawers: metal rulers, a small screw-driver, five shuttles, rubber for shuttles, a paper of needles, and still other accessories, more or less minute, which will render excellent service. Housekeepers who have a Csepel 30 do not need to run to the mechanic because they lack a shuttle, a needle, or for a small repair. Among the numerous cases, the star of the Csepel 30s is the "Salon-Cabinet" on account of its imposing exterior. When closed the "Salon-Cabinet" is transformed into an elegant bureau or

or a bar cabinet containing delicious drinks.

Before saying good-bye to the Csepel 30s let us mention
the new sewing machine mounted on feet of varnished wood.

After having seen these machines, one could not doubt that
they will achieve brilliant triumph on the export markets.

NEW CHANGE OF DESIGN IN THE CSEPEL 125 CUBIC CENTIMETER MOTORCYCLES

The tall figure of the foreman in his long white coat appears erect in the midst of the immense forest of 120 cubic centimeter motorcycles, like Gulliver in the kingdom of the dwarfs. However, the Csepel 125 cubic centimeter motorcycles are not dwarfs in any sense of the word. They are sturdy machines, the best there are.

"Our 125 cubic centimeter designs," says the foreman, passing his hand affectionately over one of the machines, "now reach 4 horsepower without difficulty. However, this output may, with a little trick of the trade, be increased even to 5 horsepower."

The builders of the Csepel 125 motorcycle are constantly striving to manufacture more and more perfect machines for the Hungarian and foreign public. The general complaint has been made that taking away the clutch still leaves much to be desired. Experiments carried out over a period of many months have finally led the builders to a suitable solution. The spiral pressure springs have been replaced by traction springs likewise of spiral form which completely free the leaves. "That is how we have been able to increase the horsepower of the motor," say the workers in the motorcycle factory.

"As for the carburetor, instead of an internal diameter of 16 millimeters for the conical spray nozzle, we now use an internal diameter of 18 millimeters." The machine tester brings to our attention the new technical improvements of the Csepel

125 motorcycles.

"It was on the basis of the experiences of the great international motorcycle touring race, the TAMS of last year, that we decided upon and later installed the set of rear telescope springs of the 125 machines.

"Up to now," the tester continued, "the current transformer necessary for charging the battery completely filled a side tool pouch. Now the reduced model current transformer is placed in the first light bracket near the speedometer and thus we have available two tool pouches. Another innovation of an electrical nature is that we have installed a dim parking light connected with the battery in the first headlight bracket as well as a light on the rear mudguard. In place of the 15-watt magneto used up to now, a 25-watt magneto guarantees perfect lighting."

Each worker at Csepel, including the tester, explains with affection, enthusiasm, and with impressive expertness the future improvements of the Csepel 125 motorcycle.

"The speedometer had been operated up to now off the front wheel. However, it often happened that the worm thread jammed and stopped the front wheel. The propulsion mechanism, placed on the left side of the rear axle now eliminates this defect. The Csepel 125 motorcycles have front and rear wheel brakes, providing much greater safety than previously."

A young workman enters the room. Instead of empty words he simply shows us the most recent technical improvements. With the aid of the standard jack he raises the rear wheel of one of

the motorcycles and spins it clockwise. After a few seconds the screw of the axle unscrews on the left side of the axle. With a simple movement he pulls out the axle and in the next minute he has in his hand the rear wheel dismantled.

/// HUNGARIAN PHARMACEUTICAL INDUSTRY

The plants of the Hungarian pharmaceutical industry which, on the world scale, rank among the most important, have seen the birth of innumerable new experimental procedures and results. Among the products of the Chinoïn Laboratories let us first mention the serum DEPOFOLLAN. This is a preparation with a folliculin base having a retarding effect, absorption of which takes place slowly. DICAPTOL is an excellent antidote against poisoning from arsenic, arsenobenzol, mercury, gold and bismuth. It is capable of saving the lives of ill persons suffering from the effects of recent poisoning due to the action of heavy metals. Our vitaminized preparations, such as VITAPLEX A, B, C, D, K, N and P are very important and have permitted the attainment of remarkable results. Among the most recent preparation of the Richter Laboratories let us point out THIOMICID, a very effective antitubercular chemotherapeutic preparation. The local and direct use of THROMBOFORT (Thrombinum lypophyllisatum) permits coagulation to be brought about even when some factor essential to coagulation may be missing. CORHORMON is the great generator of the cardiac muscle. ATRIPHOS is a natural regulator of the circulation of the blood. In addition to the preparations of these two laboratories, let us also mention the very important products of the United Pharmaceutical and Dietetic Products

Plants. These laboratories produce not only excellent tonics, but also DIENOCSTROL, a synthetic preparation having an estrogenic effect. TEAB (tetraethylammoniumbromide) effectively reduces blood pressure by dilating the peripheral blood vessels.

The value and effectiveness of Hungarian pharmaceutical products are recognized throughout the entire world. These results are due to the fact that our pharmaceutical industry, which is making rapid strides, has been in a position to produce a whole group of modern preparations which have met with undeniable success among the medical profession and the sick.

THIOMICID

For many years now we have been seeing antitubercular preparations appear in turn and then rapidly disappear, highly recommended at first, then recognized to be ineffective and thus causing great disappointment. Consequently the doctors have acquired the habit of greeting preparations of this type with distrust. Modern therapy uses three types of preparations in the treatment of tuberculosis: PAS (paraaminosalicylic acid) thiosemicarbazone and streptomycin. These preparations already mark considerable progress over the substances used formerly: their action against the pathogenic agents of tuberculosis can be observed by the experimental or clinical method.

From the chemical point of view THIOMICID is the most effective compound of the paraacetylaminobenzaldehydethiosemicarbazol group. In contrast with PAS it must be administered in small doses (25 mg) and its use does not bring about acquired tolerance [in the

bacilli] as does streptomycin. The Koch bacilli degenerate through its action: they lengthen or swell in blister form, only color through contact with Gram liquid, become granulated, and appear in the form of scattered granulations. The endotoxin suddenly freed by the destruction of the bacteria can cause disagreeable secondary symptoms, so that the dosage must be well advised and adapted to the individual needs of the patient.

THIOMICID is used with success in the treatment of pulmonary tuberculosis; it transforms part of the inoperable cases into operable cases, diminishes the seriousness of the operation and the risk incurred, mobilizes the defensive strength of the organism and permits post-operative dissemination to be avoided which risks, compromising the success of surgical operations. It also retards the development of acquired tolerance to streptomycin. It has made it possible to obtain outstanding therapeutic triumphs in cases of bronchial, laryngeal, intestinal, renal, cutaneous tuberculosis and tuberculosis of the bones and joints, as well as in cases of tuberculosis of the trachea.

The dosage of THIOMICID is made with prudence. It is necessary to take into consideration not only the amount of the dose and the tolerance of the patient but also the location and character of the tubercular process and the manner in which the latter reacts to the effects of the treatment. THIOMICID is sold in tablets and can even be used locally in the form of a suspension. Its great advantage is that it can be administered simultaneously with other antitubercular preparations. Together with collapse therapy, THIOMICID is at the present time one of the most valuable weapons in the struggle against tuberculosis.

THE DEVELOPMENT OF HUNGARIAN TELECOMMUNICATIONS AND PRECISION MECHANICS

The development of these two kindred technological industries was already started in our country in the years prior to World War I. In the field of vacuum technique the United Incandescent Bulbs and Electricity Company, Ind., already occupied a preponderant place on the world market with its famous "Tungsram" brand. The machinery section of this plant has devoted itself intensively to telephonic and telegraphic equipment and other low voltage equipment. During the period between the two world wars radioelectric engineering made great strides, and the Hungarian industry played a considerable part in it. Radioelectric technology developed rapidly into an important industry and several well equipped plants began to manufacture radios, that new telecommunication product. The manufacture of radio sets has reached a remarkable level in Hungary, for it has made parallel progress with the manufacture of radio tubes, always taking into consideration the most recent improvements. In the field of the manufacture of radio sets several international patents of great importance are linked with the names of Hungarian engineers and technical experts. At the present time, in the second year of our first Five-Year Plan, we have already exceeded quantitatively and qualitatively our pre-Liberation production. In addition to several hundred types of incandescent bulbs including normal, special, krypton, and self-filling bulbs, all varieties and all types of tubes for reception and transmission such as flat tubes all-glass tubes, and miniature tubes also figure in the manufacturing program. The strong demand for transmission tubes has

prompted our government to build a special plant for transmission tubes. The latter is already in full production, thus assuring the manufacture of transmission tubes from the smallest capacity to those of several hundred kilowatts.

A New Branch of Industry: the Manufacture of Vacuum Machines

An important factory, based on vacuum technology, produces incandescent bulbs, radio tubes, automatic blowing apparatus for the manufacture of bulbs and balloon flasks, pumps, and many other articles of equipment of this type. These products are also much sought after abroad. From the manufacture of radio tubes it is but a step to the building of receiving sets. This step has been brilliantly taken by the Orion Plant, the most eminent representative of this industry in Hungary.

The advanced stage reached by the Hungarian radioelectric industry is also evidenced by consignments made to countries where this industry is not yet sufficiently developed.

The manufacture of transmitting sets likewise constitutes an important branch of Hungarian telecommunications engineering. At the present time telecommunications engineering enterprises are manufacturing all types of transmitting sets from low power transmitting sets to large transmitters, and are exporting a considerable number of these products. The Hungarian telecommunications industry has developed a whole series of automatic telephone exchanges and sub-exchanges. The 7-A/2 automatic exchange, which is universally known, and the 7/D exchange, designed for small towns, are the types favored by the Hungarian

Postal Department and, at the same time, by numerous foreign postal departments. This applies also to sub-exchanges, which are built to handle 6-10-25-50-100 and up to several thousand telephone lines, with or without facilities for tying into trunk lines, provided with transmission switchboards designed according to the most modern principles. In the case of these telephone sub-exchanges the most recent improvements of telephony have been adopted, such as automatic call-back and remittance.

The manufacture of carrier current equipment is also an important branch of telephony. Besides carrier current equipment with one, three, or more channels, the Hungarian telephony industry also manufactures equipment needed by the telegraph service, including amplification equipment. There is also included in this branch the manufacture of equipment for aerial cables, Pupin coils, etc. Let us mention, as an example, the Remix Plant, which produces resistors, condensers, and potentiometers for radio, or the Tonalit Plant which manufactures radio-phonographs and miniature motors for telecommunications.

The manufacture of railroad signal installations is a relatively little known branch of telecommunications. It is very seldom placed in this category, although these installations are composed chiefly of tele-technical elements. Hungarian telecommunications engineering has a great past in this field also. The Telephone Factory, Inc., has been producing for several decades automatic and electrodynamic block signal installations for railroads and, quite recently, it has undertaken the construction of a type conceived in accordance with the newest electrical engineering system.

Progress in precision mechanics has been even more rapid than in telecommunications. The Electrical Apparatus and Instruments Plant works not only to supply the domestic market, but also for export.

In the production of precision instruments, the activity of the Electronic Measuring Instruments Plant is among the most important. One cannot pass over in silence the manufacture of scales, material testing apparatus, and welding apparatus.

// Our enumeration would not be complete if we omitted the surgical instruments industry, which has progressed at the same rapid pace as the aforementioned industries and ranks at present among our industries which export the most. As a consequence of the progress which medical science is making every day, new and more numerous surgical instruments are continually becoming necessary. Hungarian industry is manufacturing a wide range of surgical instruments, from the most simple suture needles through injection syringes and operating instruments to the most complicated electro-mechanical instruments such as, for example, cystoscopes and electrocardiographs. The manufacture of X-ray apparatus is one of the special branches of electro-mechanics. Hungarian industry is making great strides in this respect also. The X-Ray Apparatus Plant is producing all the X-ray apparatus necessary for medical practise, in the most modern models, both for therapeutics and for diagnosis. But at the same time the manufacture of X-ray apparatus for testing materials likewise is included on their manufacturing program. //

There is no doubt that the Hungarian precision mechanics industry will continue its remarkable development in the future also and will be able to acquire new outlets for its products which, assuredly, will give complete satisfaction to the foreign clientele -- Tibor Nadas.

NEW HUNGARIAN RADIO SETS

The Orion Radio Plant is the most important and perhaps the oldest of the enterprises of the Hungarian telecommunications industry. If we review the results obtained during the last few years, we note that from the point of view of sensitivity, of sound reproduction, of reception of short wave transmissions and of appearance, the new Orion receiving sets have made considerable progress. If we take off the cabinet of the new Orion receiving sets, we are struck by the well thought out and very rational arrangement of the parts and by the richness of the electrical engineering and mechanical innovations. One innovation which is very interesting is as follows: they have used in the Orion sets very modern wave-length selectors known as rotating selectors which permit the shortening in an effective manner of the electrical coupling of oscillating circuits, which contributes appreciably to the elimination of losses.

Thanks to the rich variety of the Tunggram tubes, the engineers of the Orion plant have been in a position to provide the sets with number of different tube circuits. More and more the plant uses miniature and Rimlock series of tubes, which permits improving not only the sensitivity of the sets, but also the sound reproduction.

The loud speakers used by Orion are the fruit of research work which was as long as it was minute.

However, the Orion plant has not been content with exporting various types of battery receiving sets and local circuit sets. It also supplies its foreign customers who are desirous of assembling the sets in their own shops with complete assortments of separate parts. The assembling of the Orion separate parts is very advantageous for the customer. In fact it contributes to the development of local industry. Then, since the cabinets are manufactured in the importing country, it is possible to give consideration to the taste of the public in these markets. The fact that the expenses of transporting separate parts are appreciably less than those of complete sets permits the effecting of considerable savings, particularly when it is a question of deliveries intended for overseas countries. Among the radio sets exported by Hungary, first place goes to the Orion 881. This is an eight-tube super-receiving set with the final stage in push-pull; it is a real masterpiece of modern radio engineering. In all wave lengths the sensitivity of the set remains less than 10 uV. The power output is 8 watts. This power is then utilized by a 200 millimeter loud speaker and another of 90 millimeters. The sound reproduction is remarkable: it is assured by a two-stage negative-reaction coupling with a regulating device for the low and high tonalities. A very interesting detail is as follows: the receiver is capable of picking up broadcasts in 6 wave bands, including practically all middle and short bands, running from 24 Mc to 150 Kc. The Orion 331 and 441 types are

likewise very popular. Thanks to their sensitivity, to the excellence of their sound reproduction, to their system of spread-out short wave bands and to the beautiful workmanship of the cabinet, they have achieved a unanimous triumph on the international market.

The Orion 221 super-receiving set, equipped with 5 Rimlock tubes, is a set of small dimensions, the power of which is nearly comparable to that of the medium-sized and large receiving sets. Thanks to its beautiful appearance and its perfect sound reproduction, it can be used as a second receiving set or alone as a universal receiving set. Among the Orion battery receiving sets, let us point out in particular the 320 B type. Its sensitivity is 150 μ V (150 volt difference in potential) on short wave, 40 μ V on medium wave, and 50 μ V on long wave. Its current consumption is very low. Thanks to its sound intensity, it permits picking up broadcasts from the most distant stations. The 551 B type battery receiving set, having a very wide short-wave band and equipped with six miniature tubes satisfies the most exacting requirements.

NEW TYPES OF HUNGARIAN RADIOS

Among Hungary's products, as with world production in general, radios occupy a primary place.

In the structural design of the Orion radios we find all the improvements of radio engineering. One of its special advantages is the perfect sound reproduction; both the verbal and the musical sound reproduction have the clarity and tonality of natural sounds.

Orion radios work with Tungram tubes and in the construction of the sets standard-type tubes are used which can be purchased easily everywhere. In most of the sets the tubes perform multiple functions, which makes our radios, in proportion to their reduced number of tubes, comparable to sets of other makes which work on a greater number of tubes.

There is a large variety of Orion radios from the economical popular radios to de luxe models. We give below a brief sketch of the description and technical data of the models for this year.

221. A cabinet with modern lines and small size covers a set of great power. Its great sensitivity is assured on three wave bands and its extraordinarily agreeable tonal quality is possible thanks to its negative reaction combined with a high and low frequency equalizer. This small set which considerably exceeds the power of others of its size, has a loud speaker of new design. Its outer appearance is elegant and has a revolving dial in three colors. In the construction of the set a Rimlock Tungram series of tubes of the newest type has been used: 2 of EAG 42, 1 of ECH 42, 1 of EL 41, 1 of AZ 41. The apparatus functions on 110-220 volt alternating current. It has 6 coupled circuits. Variation in its wave bands: I. Short waves, 16-50 meters, normal 185-585 meters; long 950-2,000 meters. II. Short waves from 13-40 meters; from 40-120 meters and medium from 185-585 meters. Selectivity + 9 KC. Weight 5.2 kilograms. Consumption, 35 watts.

331. A magnificent superheterodyne receiving set which works on short waves, normal and long waves, and assures splendid reception of the most important broadcasts in short wave, normal, and long wave bands with perfect fidelity of rendition. Its exceptionally beautiful sonority is assured by its first quality electrodynamic loud speaker and by counter-reaction combined with frequency correction. Its extraordinary sensitivity on short waves should be mentioned. The tubes used are 2 of ECH 21, 1 of EBL 21, 1 of EM 4, 1 AZ 1. It is a set having six coupled circuits. Its selectivity is ± 4.5 KC. There is automatic retarded compensation for fading. Its power output is approximately 3.5 watts, its consumption approximately 45 watts and its weight 11 kilograms.

441. A superheterodyne of great power which operates on four prolonged ranges of short wave, long and normal wave length. The five tubes of the set fulfill eight functions. Its cabinet is a piece of tasteful furniture with a revolving glass dial illuminated from the inside and perfectly visible. It owes its fidelity of reproduction of verbal and musical sounds to its powerful loud speaker and the negative counter-reaction. The solidity of its mechanical construction is a guarantee of long functioning of the set without repairs. This type of radio, which combines a large number of advantageous qualities, excels among all those of its category. Tubes: 2 ECH 21 tubes, 1 EBL 21 tube, 1 AZ 1 tube and 1 EM 4 tube. It operates with alternating current of 107-122-132-150-185-215 and 240 volts. Wave bands: 14-41 meters; 16-19 meters; 25-31 meters; 41-50 meters; 190-590 meters; 715-2,000 meters. Its power output is approxi-

mately 3 watts, its selectivity ± 5 kc. It has six coupled circuits. It consumes 55 watts and its weight is 15 kilograms.

881. It is a superheterodyne whose 8 tubes accomplish 11 functions. Its cabinet of luxurious appearance is light walnut in color with darker stripes of chestnut. It works in six wave ranges. Its reception extends over the complete range of short and normal waves without a gap from 13 meters to 580 (including the range between 50 and 200 meters) and in the long waves from 1,000 to 2,000 meters. For each wave band it has a revolving glass dial which considerably increases the visibility and facilitates tuning in the stations. Only that dial is illuminated which corresponds to the range in which the set is operating. Its mechanical and electrical construction is as solid as possible. The abundance of replacement parts for it assures perfect functioning of the set for many years. This receiving set has been provided with the latest innovations of circuit technique, great reserve of power, equalization for high and low frequency combined with a negative reaction circuit, final push-pull amplifier, and two electrodynamic loud speakers, one of which was intended especially for high-pitched sounds. The control in three gradations of the width of the range makes it possible to tune in distinctly stations which are very close to one another and makes it possible for reception of them to have the most perfect tonality. Tubes: 2 EF 22 tubes, 2 ECH 21 tubes and 2 EBL 21 tubes; 1 AZ 21 and 1 EM 4. Wave bands 13-19, 19-35, 35-75, 75-185, 185-585, 1,000-2,000. The set operates with alternating current of 110-127-150-185-220 and 240 volts. It

consumes approximately 75 watts, has an auditive strength of 8 and has 7 coupled circuits. It has a selectivity of $\pm 4-6$ and 9 kc. It has retarded regulation of fading, a negative reaction circuit with high and low frequency equalization. The weight is 23 kilograms.

320 B. This set is a semi-superheterodyne of great power and limited consumption which operates with batteries. A series of miniature tubes operating from batteries assures the aforementioned conditions of power and consumption. Its sensitivity equals that of the current network sets of similar category. The surprising power in the tonality is due to its sensitive electrodynamic loud speaker with permanent magnet. The naturalness of the tone is assured by the counter-reaction combined with the frequency correction. Tubes: 1 1R5T tube, 1 1T4T tube, 1 1S5T tube, 1 DLL-101. Wave bands: 16-50, 198-585, 940-2,000. It has six coupled circuits and a selectivity of 6 Kc. The dial may be illuminated through a pocket battery button. Batteries: 90 anode volts, 1.4 heating, 4.5 battery volts. Consumption 16 mA anode current, 175 mA heating current. Auditory power, 0.2 watts. Weight 6 kilograms.

MACHINE TOOLS

For several decades a struggle has been going on to improve the materials out of which machine-tools are constructed, to standardize them, and to modernize the design of machine-tools. Such new materials as carbon steel, hardened steel and high-speed steel, and later cemented carbide known since the 1930's, gave

great impulse to the creative imagination of engineers in machine-tool design. Tools for internal turning, with negative cutting angle, gave rise to the idea of a new type of turning work, the so-called high-speed cutting method, which in turn has given rise to the design of new types of machine tools. The heavy industry of Hungary, since the liberation, has geared its program to the machine-tool building industry, and taking into consideration the points of view detailed above, has produced the types of machines which utilize all the given possibilities for the new types of steel.

The impetus of the accelerated pace of reconstruction in liberated Hungary made it possible for our machine tools to appear as early as 1948 on the world market. The export of our machinery, due to its excellent quality, has even reached some foreign markets in countries which are themselves exporters of heavy industry products. To mention only the successes achieved in the markets of Central Europe, we must above all speak of our sales in Germany, where we have sold during the last 12 months, great quantities of radial boring machines and other heavy machinery. During the last 3 years we have also sold to Sweden a great quantity of radial boring machines, milling machines and lathes. We have sold a great number of these three types of machine tools in Austria also. In the last few months our sales have been directed toward some countries with highly developed heavy industries such as Belgium, France, Italy and Switzerland. We have also sold to Czechoslovakia, which is one of the most important countries which export machine tools, a greater quantity in the past month. With respect to the design of our machine tools, we have pursued the following general principles: simplification of operation, reduction of the number

of coupling elements, reduction of engagement time, central control, high-quality performance, great motor power, and solid construction free of base and pedestal vibrations. We have been especially concerned about attaining high cutting speeds and rapid changes of speed in our machines, and reducing the time of preparatory operations. We shall describe here briefly Hungarian machine tools which have attained most success on the export markets.

The EU 175 Lathe

This machine is the best one which has been produced up to now in the category of universal lathes. Its designers have applied for five international patents in connection with them. The lathe is equally suited for rough profiling cut-off work, and finishing. The high spindle speed (1,600 per minute) of the headstock spindle makes it possible for the lathe to handle high-speed work. To change the speed of the headstock there is an ingenious mechanism with which one can set the number of revolutions for successive operations. Thus at the desired moment the change of speed is made rapidly. Headstock spindle drive is directly off the pulley through a V-belt, assuring its high speed. This and the fact that the headstock does not have a keyed pulley on the spindle, together with the precision of the transverse slide make it possible to use this lathe with diamond tipped tools.

The headstock is made of alloy steel, solid, bored and lapped, with ball bearings for the spindle. The lathe has a 7.5 horsepower motor. The Norton gear box is completely enclosed and affords 200 different speeds without change of pulley. The special design of the transverse carriage makes it impossible to

have breaks due to negligence. The gear box (of cast iron) is placed on the left support, coupled to the motor through a flexible axial coupling. Threading and flat work is controlled by a special lever, thus avoiding engaging wrong feeds. On the right support is mounted the water pump for cooling, geared directly to its motor. In the box on the right support is the water tank. The base of the tail-stock housing (movable) is of tempered cast iron and moves on its own prismatic flat bed. We also would like to mention that all the spindles, heads, and gears are made of special hardened and polished steel alloys.

Milling Machines

The ML 21 and 22 milling machines are a great export product of the Rakosi Plant. The type 22 is the largest and most modern milling machine, constructed in universal form and vertical. These milling machines are of beautiful form, solid and of excellent quality. They are perfectly suited for economical, precision work. Their design shows all the advances in the manufacture of milling machines. Their chief advantages are: single lever control, high production, great cutting speed, previous selection of continuous and stepped speeds, precision, universal use, simple control, independent drive of milling head and table, automatic change in the number of revolutions of the milling head, speed regulator, automatic lubrication, safety control, high quality materials used in manufacture, and precision workmanship.

The entire capacity of the 12 horsepower motor serves solely for the milling drive. It is especially suited for jobs with

hard-alloyed plated cutters. The change of speeds is effected through a new system of 20 gradations between 19 and 1,500 revolutions per minute. The change of speeds is controlled with the main lever through an electrohydraulic servo mechanism. The same lever controls the horizontal travel of the table and the return of the milling head. By placing the lever in center position, the milling head stops in one second from maximum speed. By changing the position of the lever, the milling head starts moving immediately at the maximum speed without taking the intermediate speeds. The successive speeds can also be set in advance and during the work. With a change of the lever, the milling machine will operate at the new speed desired.

In the ball of the handle of the main lever there is a bulb which lights when the main switch is closed, that is, when the milling machine is ready to operate. The lever moves in two planes, its directions corresponding to those of the table. In pushing the lever downward, the bulb goes out, showing that the pre-selector is operating, and when the change of speed is completed, it lights again.

Numerous standard and special attachments for the universal milling machine make possible very wide use of the machine. The vertical milling machine is absolutely identical with the universal, with the sole difference in the position of the work. Two catch pins placed in the front part of the vertical table serve to check the vertical movement of the milling machine exactly. The lower catch pin may be adjusted through a screw and micrometric scale. The cutter can be tilted to the right and to the left so that the

machine can be utilized universally and to the fullest extent of the capacity of the machine. All the spindle gears of the UF and VF 22 milling machines are made of special hardened and polished steel alloys.

The Radial Boring-Machine

The Rakosi Plant produces six types of radial boring-machines in the RF series for boring capacities from 40 millimeters to 100 millimeters and for maximum extension of 1,250 millimeters to 3,000 millimeters. The warm welcome received by these machines on the export markets is due to their great efficiency, high degree of precision and universal utilization. High number of revolutions per minute, great extension, high horsepower, easy and economical operation are the outstanding characteristics of these machines.

Precision operation is guaranteed by the main casting which is very rigid, of excellent quality, polished, and made with precision workmanship. These boring-machines are used with magnificent results in large plants for standardized production jobs, and also in special order shops for a great variety of jobs and under different working conditions. Its ease of handling and simple control save much time in the work. The solid and rigid construction of these machines makes them capable of through-drilling with spiral drills, boring pre-drilled holes, drilling and tapping.

The type recently perfected and which at the present time is one of the largest radial boring-machines manufactured is the RF 5, which includes the most modern advancements in design.

This new type of radial boring machine has some advantages which no other similar foreign machine possesses, as for instance: the preselector for speed and pitch of drill, the electrohydraulic column, spindle, and arbor movement, the micrometric regulation of the pitch of the drill, its safety devices and automatic switches which avoid the breaking of drills.

The Planing Machine

Type PW 550 is a powerful modern machine, built and designed with the greatest precision in each of its details. Its beds, planing heads, axles, and gears are made of hardened and polished steel. The frame is made of reinforced cast iron, assuring smooth and continuous functioning in the most difficult jobs. The length of stroke of the planing head can be adjusted while it is functioning. With the removal of the standard table chuck, very large work can also be put on the bed. The fixed position of the table during functioning is assured by a very solid catch pin, preventing any tilting of the piece being planed. Because of the aforementioned characteristics, the PW 550 planing machine is very useful in tool shops, in machinery repair shops, and in mass production plants.

The EAN lathe

A light machine tool, which can be easily handled, and is very useful in repair shops and small machine-building plants for trimming and smoothing. Its gear box, Norton type, affords a great variety of speeds. On account of its ample speed and variable pitch headstock it is also suitable for cut-off work. It has a

reinforced cast iron base. Due to its ample swing over bed and its dismountable bed, it is well suited to turning very large work. The possibility of wrong feed engagement is eliminated by its automatic safety mechanisms. Very shortly we shall present other Hungarian machine tools for export such as semi-automatic turret lathes, straightening machines, cold hydraulic saws, double-head milling machines, and shaping machines of different types, high quality and precision.

[Caption over picture at bottom of page 7 reads: Radial Boring Machine, Type R.F. 35]